

The genetic and historical linkage between the Old Norwegian Sheep, the Icelandic Sheep and the Navajo Churro.

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Thesis

It may be possible to substitute a readily available double coated sheep fleece from the American Southwest for the original Scandinavian double coated fleece in order to make suitable vadmal fabric for clothing.

Introduction

A popular subject of Arts and Science projects in many historical recreation groups is the reconstruction of Norse garments. In particular, hobbyists and scientists alike have extensively researched garments recovered from archaeological excavations in the southeastern settlements of Greenland, and more specifically from the Herjolfsnes cemetery. A characteristic of the garments recovered in these excavations is that many of them are made using a cloth known as vadmal (Old Norse *vaðmál*.)

The sheep used in the production of vadmal varied from area to area, but the nature of the production dictated the use of double-coated sheep (sheep having an outer coat formed of hair, and an inner coat of wool) such as the Old Norwegian sheep.¹

Because of the rarity of the original Old Norwegian sheep and its limited geographical location², it is difficult if not impossible for a historical reenactor in the Americas to obtain vadmal cloth or even fleece from the Old Norwegian sheep in order to create historically accurate garb for a Norse persona.

¹ Østergård, Else (2004). *Woven into the Earth: Textiles from Norse Greenland*. Aarhus University Press. pp. 62–64.

² “Norwegian Old Spael Sheep”. *Old Norwegian landrace sheep* – [www.rala.is/beta/23 Norwegian Old spael sheep.htm](http://www.rala.is/beta/23%20Norwegian%20spael%20sheep.htm) [Retrieved 2011-11-14]

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Discussion

The beginning of the flock

The common ancestor for domestic European sheep is the Mouflon (*Ovis gmelini*). This sheep is a subspecies group of wild sheep, and considered feral; there is evidence of early domestication. The Mouflon breed is still in existence today, although endangered. The typical characteristics of this breed are a short tail and a short hair coat. It was this breed that man began to domesticate about 10,000 years ago in the Fertile Crescent of western Iran, Turkey, Syria and Iraq.³

In the domestication process, certain animals such as sheep start to lose their fear of men for a variety of reasons: easier access to food and shelter, protection from predators and so forth. Because mouflon may have been docile as babies, they might have been kept in households long enough to reach sexual maturity and begin breeding. As selective breeding took place, the sheep became quite different from their wild cousins. Colors changed, coats changed, and horns became absent. Shapes of heads changed and ears grew longer and floppy in some animals. Tails grew longer and the hides took on different thicknesses and qualities.⁴ The sheep began to change genetically with the influence of the humans with whom they resided.

At some point during the domestication of the sheep, the inhabitants of the Fertile Crescent began to travel. As often happens, people could not agree on just one direction and they split into three main groups. Some went south out of the Fertile Crescent, some went west, and some went east. The sheep that went south into Africa are not germane to this research, and will not be discussed. The sheep that went west became the European Mouflon, and the sheep that went east became the Asian Mouflon.⁵

We know this from several sources. Archeology plays a large part, as does the written record in the form of ancient texts. The third way we can document this travel is the genetic record as found using DNA.

³ Miika Tapio, et. al. Sheep *Mitochondrial DNA Variation in European, Caucasian, and Central Asian Areas*. Molecular Biology and Evolution, (September 2006) 23 (9): 1776-1783.

⁴ Lyudmila N. Trut, (March-April 1999) "Early Canid Domestication: The Farm-Fox experiment" American Scientist, Volume 87, Number 2. Page: 160

⁵ Ibid 3

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The role of Genetics

A genealogical DNA test examines the nucleotides at specific locations on an organism's DNA. Combinations of DNA sequences called haplotypes (a set of gene or genetic marker sequences) are inherited as a unit. Specific groups of similar patterned and related descendant haplotypes that share a common ancestor are grouped together and called haplogroups. Haplogroup branches are assigned alphanumeric designators by geneticists.

The haplogroups most commonly studied are Y-chromosome (Paternal or Y-DNA) haplogroups and mitochondrial DNA (mtDNA) haplogroups, both of which are used to define genetic populations. Y-DNA is passed solely along the patrilineal line, from father to son, while mtDNA is passed down the matrilineal line, from mother to offspring of both sexes. Neither recombines, thus Y-DNA and mtDNA change only by chance mutation at each generation with no intermixture between the parents' genetic material.⁶

The Paternal DNA and Mitochondrial DNA studies of European, African and Asian domestic sheep suggest that there are at least three major and distinct lineages. The lineages we are concerned with are the Type A or Asian and the Type B or European. Both of these types are believed to have been descended from different wild ancestor species of mouflon, somewhere in the Fertile Crescent.⁷

Sheep on the move

The B Haplogroup sheep that went west to Europe (indicated by a blue path on Attachment A – “Travel routes and genetic diversity map”) took two main routes. The first was an overland route through the Rhine river valley that leads from the Black Sea to Central Europe. The second was a seagoing route through the Mediterranean Sea.

The early transport of the seagoing B haplogroup sheep was done by the Phoenicians, an advanced sea faring/trading civilization that established ports and spread their culture - along with the sheep of the B haplogroup - along the Mediterranean Sea. One of their ports was

⁶ Charles F. Kerchner, Jr. (2004). *Genetic Genealogy DNA Testing Dictionary*, CF Kerchner & Associates. Emmaus, PA.

⁷ Ibid 3

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established just north of the modern day port of Cadiz at the mouth of the Guadalquivir river, on the Atlantic side of the Iberian Peninsula (modern day Spain and Portugal).⁸

An introduction of the A Haplogroup sheep (indicated by a white path on Attachment A – “Travel routes and genetic diversity map”) into the nominally B haplogroup sheep occurred when the sheep of the A haplogroup that originally traveled east to Asia later migrated north and west to meet in the area at the eastern most shores of the Baltic sea and mixed with European sheep of the land going branch of the B haplogroup that had originally migrated to the west and later to the north.

It follows then that the original sheep used in the production of vadmal, the Old Norwegian sheep are of a mixed haplogroup. They are comprised primarily of the B (European) haplogroup and minimally of the A (Asian) haplogroup.⁹

These mixed sheep (indicated by a blue and white dashed path on Attachment A – “Travel routes and genetic diversity map”) then progressed north and west into Scandinavia to settle in Norway. These B_(A) haplogroup sheep, the Old Norwegian, were then carried by their humans in ships to spread throughout the North Atlantic regions to become the Icelandic, Faeroe, Shetland and other North Atlantic breeds of sheep. These sheep even made it as far as Greenland during the settlement of the island between 989 and 1000 CE.¹⁰

Coming to America

There is no evidence that the Old Norwegian sheep were ever imported to the Americas during Spanish colonization.

The breed that was initially used by explorers and settlers for meat and milk during the colonization of the Spanish Americas was the Lebrijano Churra. This breed originated from the B haplogroup sheep imported into Andalusia by the Phoenicians through what would later become the port of Cadiz, Spain. The Lebrijano Churra has a double coat and the primitive

⁸ Filipe Pereira, et. al.. (2006) *Genetic Signatures of a Mediterranean Influence in Iberian Peninsula Sheep Husbandry*. Molecular Biology and Evolution (July 2006) 23 (7): 1420-1426.

⁹ ibid

¹⁰ ibid 3

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genetic base comparable to the Old Norwegian sheep of Norway and is the ancestor of the American Southwest's Navajo Churro.

It would have been this breed, the Lebrijano Churra, which the Italian explorer, colonizer, and navigator named Cristoforo Colombo, or Christopher Columbus, would most likely have taken with him during his exploration of the New World. In the years prior to his convincing the Crown of Spain that he could find a way to the West Indies by going across the Atlantic Ocean, the Spanish crown had colonized the Canary Islands just west of the mainland. (This becomes a very significant part of our story in the future.)

Now, back to Columbus; as he works his persuasive magic on the Crown of Spain, he is allowed three ships to make his first voyage out of the port of Palos. On the evening of August 3rd, 1492, Columbus departs from Castilian Palos de la Frontera with three ships. Columbus first sailed to the Canary Islands off the coast of Africa which were ruled by the Crown of Castile, where he restocked provisions and made repairs, departing on September 6th, 1492 for the westward voyage which would last five weeks before land was sighted on October 12th, 1492.¹¹

When he returns to Barcelona on March 15th of 1493 with news that he has discovered a new and exciting world full of riches (Even though what he found was the Antilles, not the East Indies), he is given the support to take 17 ships of materials and people along with livestock to set up a foothold in the new world. With this first load of goods, there are listed in the manifests sheep.¹² These sheep would likely have been the Lebrijano Churra, the predominant breed in the area around the port of Cadiz which was his port of departure on this second trip.¹³

An important consideration in transporting livestock via ship over vast spans of ocean is that they tend to get sick and die. Additionally, the feed and water it takes to support them is immense. To offset these issues, the Spanish Crown came up with a way to move the animals and limit the impact on them. They used the Canary Islands as a depot for the colonization of the west. The materials and animals were moved from the mainland of the Iberian Peninsula to the

¹¹ Clements R. Markham, ed., *The Journal of Christopher Columbus (during His First Voyage, 1492-93)*, London: The Hakluyt Society, 1893, pp 15-35.

¹² Bartolome de las Casas, *The History of the Indies* (Caracas: Ayacucho Library, 1986), vol. 1, pp. 83 & 366.

¹³ A. Rodero, et. al.. (1992) *Primitive Andalusian Livestock and their Implications in the discovery of America*. Archivos de Zootecnia, Vol. 41 (extra), #154 pp. 383-400

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Canary Islands and allowed to acclimatize to the moves. As the needs of the colonizers were drawn down from the islands, the animals were replenished from the Spanish mainland.¹⁴

Those animals taken to the west were then dropped on the Antilles to gather their strength and increase their numbers before again being moved across the Gulf of Mexico to the mainland of Mexico, Nuevo Mexico, Florida and South America. From these ports, the sheep were then moved into the colonized areas and later taken to the new areas as the explorers continued their explorations¹⁵ as indicated by the yellow paths on Attachment A – “Travel routes and genetic diversity map.”

Finally, the Lebrijano Churra was brought to the Rio Grande Valley by Don Juan de Onate in 1598 as he claimed the area for the Spanish Catholic Church. He settled in the area of modern day Alcalde, New Mexico, just north of Espanola, New Mexico.¹⁶

During the next centuries, the sheep had quite an adventure. During that time, they became very important to the lives and culture of the indigenous peoples and had a name change, becoming known as the Navajo Churro¹⁷ or simply the Churro. They went from a large population to almost extinct, and are only now starting to recover¹⁸ through the efforts of a great many people.

Conclusion

While we cannot readily find wool from many of the original sheep breeds that were originally used in the manufacture of vadmál due to the rarity of those breeds, wool from the modern Navajo Churro¹⁹ (originally named the Lebrijano Churra during the colonization of the Spanish Americas in the late 16th century) may be a suitable substitute. This sheep closely matches the genetic backgrounds of the Old Norwegian and Icelandic sheep, both being a double-coated primitive base sheep from the B haplogroup. The absence of inclusions of the A haplogroup in

¹⁴ ibid

¹⁵ ibid

¹⁶ Simmons, Marc, *The Last Conquistador: Juan de Oñate and the Settling of the Far Southwest*, University of Oklahoma Press, Norman, Oklahoma, 1991

¹⁷ “The History of the Navajo Sheep Project”. *Navajo sheep project* – <http://navajosheepproject.com/nsphistory.html> [Retrieved 2012-03-24]

¹⁸ Ibid

¹⁹ “Navajo-Churro Sheep/united states of America”. *Breed Data Sheet*. Domestic Animal Diversity Information System (<http://dad.fao.org>) [Retrieved 2011-11-14]

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the Navajo Churro should not present a major impediment to the genotyping, as the A haplogroup inclusions were minimal and of a similar primitive breed from the original base stock.

An empiric investigation of this theory will be performed by obtaining fleece from the Navajo Churro and using it to spin and weave a sample of vadmál fabric. The specific requirements of the thread diameters, thread spin angles, and warp and weft thread densities for period vadmál are well documented,²⁰ and should be obtainable using the Navajo Churro fiber in order for the experiment to be considered a success. If a sample of vadmál - either period or recreated using period techniques and using wool from the original breeds - can be obtained, a more specific comparison can be made to determine the accuracy of the match.

²⁰ Ibid 1

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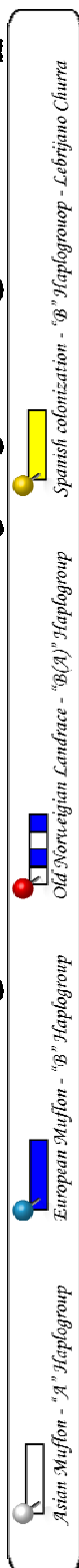
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Attachment A, "Travel routes and genetic diversity map"

Travel routes and genetic diversity of target sheep



Note that travel paths and destination points are approximated

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